



434-003

ENQUIRY

Bharat Heavy Electricals Limited
 (A Government of India undertaking)
 HIGH PRESSURE BOILER PLANT
 PURCHASE DEPARTMENT/VALVES
 TIRUCHIRAPPALLI-620 014.

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ENQUIRY NO.

DATE

DUE DATE FOR
QUOTATION

EN-SAC- 215

01.03.2014

31.03.2014

Please quote Enquiry No., and due date in all correspondences.
 This is only a request for quotation and not an order.

SL.NO.	MATERIAL CODE DESCRIPTION	UNIT	QTY	DELIVERY SCHEDULE	
	DRAWING NO TDC NO.			QUANTITY	DATE

**SUPPLY OF LOW -TORQUE ELECTRICAL
ACTUATORS.**

-This enquiry is for LOW-Torque Actuator
with torque value less than 100 KgM.

Offers are invited for all the actuator categories
listed in the Annexure-I with various features.

Offer to be furnished also for the various price
adders and spares furnished in Annexure 1.

The offer should also contain acceptance to our
technical and commercial conditions.

The Prices quoted for each item must be:

- Indigenous vendors: F.O.R BHEL Trichy
basis & F.O.R-BHEL Goindwal basis quoted
separately.
- Foreign Vendors: FOB nearest
airport/seaport.

Note:

Test Certificates are required.

Motor TC is required.

Guarantee Certificate is required.

The following documents are enclosed

1. Annexure -1 - Indicating the approximate quantity
and categories of actuators and associated accessories
and spares required.
2. Technical Specifications & Instructions for packing
3. Special Terms and conditions and Scope of supply
4. General Commercial Terms and Conditions
5. Integrity pact – To be filled and submitted

Required Delivery: As mentioned in our special terms
and conditions.

Date , Time & Venue of tender

- a. Technical Bid opening : **31.03.2014 at 14.30** IST
at Valves Purchase Conference Hall , Building No
24,BHEL Tiruchirappalli-620 014,Tamil Nadu State,
India.
- b. Price Bids will be opened for vendors whose offers
are technically suitable alone. The intimation
regarding price bid opening will be informed later.

The rate of Excise Duty and Sales Tax, Prevalent on the date of
quotation, should be clearly indicated in the quotation itself. If
these particulars are not provided, the quotation is liable for
rejection.

Please, submit your lowest quotation in duplicate subject to our
terms and conditions overleaf, for the above materials, so as to
reach us on or before the due date before 2.00 p.m IST.

Quotations will be opened at 2.30 p.m IST on the due date in the
presence of tenderers who may wish to be present.

Last minute tenders are liable to be rejected.

Yours faithfully,

**For Bharat Heavy Electricals Ltd
Sr. Manager (Valves Purchase)**



Bharat Heavy Electricals Ltd

(A.Govt.of India Undertaking)

Valves Purchase, Tiruchirappalli- 620 014. INDIA

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Annexure – 1 to Enquiry No: EN-SAC-215 dated 01-03-2014

List of low torque actuators required (Up to 100 Kg-M torque)						
Sl.No	Torque Range (Kg-M)	RPM (Approx)	Out put flange details (LD x PCD x Bolt Details.)	Trichy qty	Goindwal qty	With Thrust compensator (Qty)
1	1-3.5	18	60 x 102 x 4Nos M10	2100	425	
2	2-6	24	60 x 102 x 4Nos M10	130	200	
3	6-15	36	60 x 102 x 4Nos M10	150	300	625
4	15-30	36	100 x 140 x 4Nos M16	1550	450	
5	30-50	36	127 x 165 x 4Nos M20	650	300	50
6	30-60	96	100 x 140 x 4Nos M16	8	375	
7	50-80	36	152 x 254 x 8Nos M16	160	--	
8	80-100	96	127 x 165 x 4Nos M16	230	400	

Note :- The qty indicated is based on 2012-13 receipt and is only indicative.

The prices may be furnished in compliance to the specification of the above furnished actuators.

Special Instructions.

1. Offers for the above actuators are required under the following categories:

(For details, please refer the list – “**Categories Of Actuators, Price Adders And Spares List**”)

- Standard actuators with Aluminium(Al) bronze drive bush with double compression cable glands
- Actuators with Electronic Integral starters with Al.bronze drive bush with double compression cable glands.
- Flame Proof actuators for Gas Group IIA, IIB and IIC separately with Al.bronze drive bush and double compression cable glands.
- Actuators with spring loaded adaptor as thrust compensator for available actuators with double compression cable glands.

Tenders have to be submitted in two parts techno-commercial and price bids in separate sealed covers.

- Optional items like *Electronic position transmitters* (non-contact type & contact type), *Plug and Socket, Integral starter unit with connectivity* (suitable for attaching to non-integral starter actuators), *Al Bronze stem Nuts, Ni resist stem nuts, Stem protection Covers 250 mm to 900 mm long, EPT (Resistance & inductive type)*, *price adder for Flame proof CI-C certification* ,providing higher RPM in place of standard RPM and any other items not covered by us, as applicable to specification may be offered as a price adder along with the offer. (For details, please refer the list – “**Categories Of Actuators, Price Adders And Spares List**”)
- All actuators shall be fitted with double compression nickel coated brass cable glands and price shall be included in the actuator base price itself, for water tight applications.
- Operational spares required as per the Spares list attached may be offered in the prescribed format enclosed. If any spares apart from the list is found necessary for smooth functioning of actuators the same may also be separately indicated and offered.
- Signed Integrity Pact (IP) should be furnished along with the offer(format enclosed). IP should be signed by authorized official of the Bidder/Vendor/Contractor. Offer without IP will not be considered.**
- This tender would be monitored by an Independent External monitor (IEM). The name of the IEM would be informed later.**

N.Parameswaran
Sr Manager/ Purchase/ Valves

Annexure - 1

**Actuator Categories, Price Adders and Spares List- to be filled and submitted
along with the offer
- SAMPLE-**

ACTUATOR CATEGORIES				
I	Standard WT Models			
	SNo	Torque Range	Model No	Rate
	001	1-3		
	002	2-6		
	003	6-15		
	004	15-30		
	005	30-50		
	006	30-60		
	007	50-80		
	008	80-100		
II	Std Actuators with Electronic Integral Starters			
	SNo	Torque Range	Model No	Rate
	001	1-3		
	002	2-6		
	003	6-15		
	004	15-30		
	005	30-50		
	006	30-60		
	007	50-80		
	008	80-100		
III	Actuators- Flame Proof with IIA, IIB certification			
	SNo	Torque Range	Model No	Rate
	001	1-3		
	002	2-6		
	003	6-15		
	004	15-30		
	005	30-50		
	006	30-60		
	007	50-80		
	008	80-100		

Note : 1) Any other price adders should also be included
2) In case of indigenous vendors, prices to be offered for - FOR BHEL TRICHY and FOR BHEL GOINDWAL separately. Foreign vendors should submit it on FOB nearest seaport only.

Annexure - 1

**Actuator Categories, Price Adders and Spares List- to be filled and submitted along with the offer
- SAMPLE-**

IV Actuators with Elec I.S.- Flame Proof with IIA, IIB certification				
SNo	Torque Range	Model No	Rate	Remarks
001	1-3			
002	2-6			
003	6-15			
004	15-30			
005	30-50			
006	30-60			
007	50-80			
008	80-100			
V Standard WT Model Actuator with Spring Loaded Adaptor (O/P Drive)				
SNo	Torque Range	Model No	Rate	Remarks
001	1-3			
002	2-6			
003	6-15			
004	15-30			
005	30-50			
006	30-60			
007	50-80			
008	80-100			
VI Std Actuators with Electronic Integral Starter AND WITH Spring Loaded Adaptor				
SNo	Torque Range	Model No	Rate	Remarks
001	1-3			
002	2-6			
003	6-15			
004	15-30			
005	30-50			
006	30-60			
007	50-80			
008	80-100			

Note : 1) Any other price adders should also be included
 2) In case of indogenous vendors, prices to be offered for - FOR BHEL TRICHY and FOR BHEL GOINDWAL separately. Foreign vendors should submit it on FOB nearest seaport only.

Annexure - 1

**Actuator Categories, Price Adders and Spares List- to be filled and submitted
along with the offer
- SAMPLE-**

ACCESSORIES & PRICE ADDERS					
I	Stem protection cover upto 250 mm long				
	SNo	Torque Range	Model No	Rate	Remarks
	001	1-3			
	002	2-6			
	003	6-15			
	004	15-30			
	005	30-50			
	006	30-60			
	007	50-80			
	008	80-100			
II	Stem protection cover 275 to 900 mmm long				
	SNo	Torque Range	Model No	Rate	Remarks
	001	1-3			
	002	2-6			
	003	6-15			
	004	15-30			
	005	30-50			
	006	30-60			
	007	50-80			
	008	80-100			
III	Prices for Adaptors (Stem Nuts) Al Bronze				
	SNo	Torque Range	Model No	Rate	Remarks
	001	1 -3			
	002	2-6			
	003	6-15			
	004	15-30			
	005	30-50			
	006	30-60			
	007	50-80			
	008	80-100			

Note : 1) Any other price adders should also be included
2) In case of indogenous vendors, prices to be offered for - FOR BHEL TRICHY and FOR BHEL GOINDWAL separately. Foreign vendors should submit it on FOB nearest seaport only.

Annexure - 1

**Actuator Categories, Price Adders and Spares List- to be filled and submitted along with the offer
- SAMPLE-**

IV Prices for Adaptors (Stem Nuts) Ni resist				
SNo	Torque Range	Model No	Rate	Remarks
001	1-3			
002	2-6			
003	6-15			
004	15-30			
005	30-50			
006	30-60			
007	50-80			
008	80-100			
V Price Diference between Ni resist & Al Bronze adaptors				
SNo	Torque Range	Model No	Rate	Remarks
001	1-3			
002	2-6			
003	6-15			
004	15-30			
005	30-50			
006	30-60			
007	50-80			
008	80-100			
VI Electronic Position Transmitter				
	Common for all the models		Rate	Remarks
001	Contact type			
002	Non contact type			
VII Price adder for providing higher RPM in place of standard RPM				
			Rate	Remarks
001	common for all models			
VIII Providing Plug and Sockets				
	Common for all models		Rate	Remarks
001	5 Pin			
002	9 Pin			
IX Integral Starter Unit with connectivity (suitable for conversion / suitable for attaching to non-integral starter actuators)				
	Required for all models		Rate	Remarks
001				

Note : 1) Any other price adders should also be included
 2) In case of indogenous vendors, prices to be offered for - FOR BHEL TRICHY and FOR BHEL GOINDWAL separately. Foreign vendors should submit it on FOB nearest seaport only.

Annexure - 1

**Actuator Categories, Price Adders and Spares List- to be filled and submitted along with the offer
- SAMPLE-**

Spares List for enquiry EN-SAC-215				
Note : If any spares apart from the list is found necessary for smooth functioning of actuators the same may also be separately indicated and offered.				
Sl. No	General Description	Part no / Vendor description	Price	Remarks
1	Limit Switch			
2	Limit Switch Assy.			
3	Torque Switch			
4	Torque Switch Assy.			
5	Motor			
6	Worm Gear assy			
7	All Electronic Card (with price break up for each)			
8	Thermal Over Load Relay			
9	Seal Kit			
10	Power Contactor Assy			
11	Selector Switch Assy			
12	One set Of DCCG used			
13	Hand Wheel With fasteners			
14	Thrust Base			
15	Terminal Board			
16	Thrust Bearing			
17	Mechanical Dial Position Assy.			

Note : 1) Any other price adders should also be included
2) In case of indigenous vendors, prices to be offered for - FOR BHEL TRICHY and FOR BHEL GOINDWAL separately. Foreign vendors should submit it on FOB nearest seaport only.

1.0 Technical Requirements

Clause_ No	Specification requirement
2.G.0	GENERAL
2.G.1.0	ENCLOSURE:
2.G.1.1	Actuators shall be of totally enclosed weather proof and dust proof construction with min. IP 68 enclosure and shall be suitable for outdoor applications. The actuator should be capable of operating in ambient temperature of -20 deg.C to +70 deg.C.
2.G.2.0	VOLTAGE:
2.G.2.1	The unit shall be suitable for operation on a 415V, 3 phases, 50Hz, -3 wire system for actuator with integral starters. -4 wire system for actuator without integral starters.
2.G.3.0	CONSTRUCTION:
2.G.3.1	Actuators shall have provision to accommodate raising spindle of the valve and the hole shall be properly covered with a removable lid. The actuator shall be supplied with stem protection tube to accommodate larger spindle travel as indicated elsewhere in this specification. All the above parts, i.e. The threaded portion of actuator, removable lids and stem protection tubes shall be able to withstand the prolonged outdoor storage without getting rusted or damaged.
2.G.3.2	The actuator shall be suitable for mounting directly on the valve. The actuator shall be capable of giving the required torque, rpm and thrust. The actuator shall be suitable for mounting in any position. Indicate the adjustable range of torque and starting torque of actuator in kgm/Nm for each actuator offered. The maximum thrust capability of the actuators shall also be furnished. The actuators shall be designed to take the full thrust. All Gears used shall be metallic. Fiber gears are not acceptable. Metallic gear trains used shall be self-locking to prevent drift under torque switch (wherever applicable) spring pressure when motor is de energised.
2.G.3.3	Actuator shall have thrust base with blank removable adaptor bush of aluminum bronze, which can be threaded to accommodate raising spindles of valve. NI-Resist material shall be supplied as optional if required.
2.G.3.4	The exact mounting arrangement with dimensions shall be clearly furnished in the enclosed drawing. The flange dimension shall be as per DIN/ISO standard. For high torque actuator mounting dimensions shall be as per the BHEL approved dimensions
2.G.3.5	The dimension drawing of the blank adopter bush shall be furnished in the enclosed drawing.
2.G.3.6	Each actuator shall have a hand wheel fitted on it for manual operation in case of power failure. It shall be possible to fully open /close the valve with the hand wheel. The hand wheel shall be designed such that its engaging lever declutches automatically when the power supply to the motor is restored. The material of the hand wheel shall be either malleable iron or steel. The hand wheel-engaging lever shall give trouble free performance under repeated operations. Side mounted hand wheel with gear can be offered as optional. The hand wheel construction shall be strong enough to withstand the impacts of normal handling and storage of actuator without any damage. The handwheel shall be able support the weight of the actuator, without any damage to actuator or hand wheel, when actuator is rested on the hand wheel.

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2.G.3.7	Actuators offered shall be with self-locking worm.
2.G.4.0	REVOLUTIONS:
2.G.4.1	Desired output shaft speeds are given below for different torque ranges. Actual speeds actuators offered shall be clearly indicated.

For low torque actuators (Up to 100 Kg-M torque)				
Sl.No	Torque Range (Kg-M)	RPM (Approx)	Out put flange details (LD x PCD x Bolt Details.)	Stem Protection Cover in mm (unless other wise specified)
1	1-3.5	18	60 x 102 x 4Nos M10	100
2	2-6	24	60 x 102 x 4Nos M10	100
3	6-15	36	60 x 102 x 4Nos M10	150
4	15-30	36	100 x 140 x 4Nos M16	250
5	30-50	36	127 x 165 x 4Nos M20	300
6	30-60	96	100 x 140 x 4Nos M16	400
7	50-80	36	152 x 254 x 8Nos M16	400
8	80-100	96	127 x 165 x 4Nos M16	500

For high torque actuators (Above 100 Kg-M torque)				
Sl.No	Torque Range (Kg-M)	RPM (Approx)	Out put flange details (LD x PCD x Bolt Details.)	Stem Protection Cover in mm (unless other wise specified)
1	28-124	22	152.4x254-8NOS M16	250
2	70-252	33	177.8x298.5-8NOS M20	300
3	180-500	36	215.9x355.6-8 NOS M24	400
4	250-600	26	228.6x406.4-8NOS M30	450
5	400-790	26	228.6x406.4-8NOS M30	450
6	400-1155	24	228.6x406.4-8NOS M30	450
7	500-1400	13	400.0x500.0-12NOS M36	500

2.G.5.0	WEIGHT:
2.G.5.1	Furnish weight of actuator including all accessories.
2.G.6.0	LUBRICANT:
2.G.6.1	Oil plugs shall be provided for filling and draining
2.G.6.2	The gearbox of the actuator shall be oil filled or grease filled. The oil/grease must be suitable for operation for 80 Deg. above ambient temperature. Furnish detail of lubricant used with Indian oil Company's BPCL , IOCL & HPCL's equivalent. The actuator shall have proper seals to prevent leakage of oil at all installation positions. The actuator construction shall be such that the oil/grease does not leak to other compartments or outside. In case of any complaint of such leakage, the complaint shall be attended free of cost within one week and root cause of the problem shall be eliminated within one month.
2.G.7.0	DIMENSIONAL CATALOGUES:
2.G.7.1	Three copies of catalogues of the actuators in English language describing the constructional details shall be enclosed. The catalogues shall also provide over all dimensions of the actuators, maximum spindle acceptance diameters and other details called for in the specification.

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2.G.8.0	O & M INSTRUCTION MANUALS:
2.G.8.1	One copy of Operating and Maintenance Instruction Manual shall accompany each actuator ordered.
2.A.0	ACCESSORIES
2.A.1.0	TORQUE SWITCHES:
2.A.1.1	Two numbers adjustable torque switches (one for open and one for close) each with 2 NO and 2 NC potential free contacts. The type of torque switch like rotary/cam shall be mentioned in the data sheet.
2.A.1.2	The torque switches shall have accuracy of plus or minus 5% of set value.
2.A.1.3	A scale shall be provided for each torque switch to set required torque. Each division shall indicate actual value of torque. The scale-setting knob shall have locking screw to avoid any setting disturbance at site due to line vibration.
2.A.1.4	Actuators shall have provision for bypassing the torque switch during initial 5% opening of valves. Details for this must be indicated in the wiring diagram.
2.A.1.5	The wiring diagram shall include details of changes to be done for making the actuator suitable for torque seating or position seating valves.
2.A.2.0	LIMIT SWITCHES:
2.A.2.1	Two numbers of position limit switches (one for open and one for close) each with 2 NO and 2 NC potential free contacts. The type of limit switch like rotary/drum/cam type shall be mentioned in the data sheet
2.A.2.2	Two Auxiliary limit switches (one for open and one for close) each with 2 NO and 2 NC potential free contacts.
2.A.2.3	Each limit switch shall be capable of being set to trip at any position independently between fully open and fully closed position.
2.A.2.4	Limit switches and torque switches shall be weather proof suitable for damp atmospheres, and shall not cause any trouble during commissioning and operation. Further the operating mechanism of the switches (like shafts, gears, cams, metallic parts etc) shall be able with stand exposure to damp atmosphere for long time without getting rusting or damaged. If any such damage is reported it shall be attended free of cost within one week and root cause of the problem shall be eliminated within one month.
2.A.2.5	The torque and position limit switches shall be suitable for the following ratings, both 240 volts, AC, 5 amps and 220 volts DC, 0.5 amps. The insulation level between each set of contacts shall be minimum of 1.2KV for 1min.
2.A.3.0	LOCAL POSITION INDICATORS:
2.A.3.1	Each actuator shall have a local position indicator to indicate 0 to 100% of valve travel.
2.A.3.2	The actuator shall be suitable for operating different valve size with varying lifts. The actuators shall have adjustable gear for the local position indicator so that accurate indication of valve position can be obtained for all valve lifts by adjusting the gears. The gears selection chart for setting of local position indicator and mechanical transmitter for different valve lifts (output shaft revolutions) shall be furnished. Also one set of change gears shall be supplies along with each actuator, alternately the change gears/spacers shall be supplied in sufficient quantities whenever required.
2.A.4.0	ANTI-CONDENSATION HEATER (SPACE HEATER):
2.A.4.1	Each actuator shall have a anti-condensation heater in the limit switch compartment. In case of integral starter actuator the space heater supply shall be derived internally, if integral starter is not available it shall be suitable for 240V AC 50 c/s single phase supply. The wattage of the heater shall be specified in the data sheet and wiring diagram.
2.A.5.0	REMOTE POSITION TRANSMITTER:
2.A.5.1	Open/Close actuator shall have two Nos. of resistance type position transmitter for remote indication. Rating of position transmitter 100ohms, 50 Volts, AC/DC. A suitable fixed dropping resistor must be put in series for limiting the power consumption.
2.A.5.2	For regulating and inching duty applications, actuators shall have one electronic position transmitter (EPT), suitable for 24V DC with an output of 4-20mA and 2 wire / 4 wire system. LVDT type transmitter shall be supplied wherever indicated.

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2.M.0	MOTORS
2.M.1.0	POWER SUPPLY:
2.M.1.1	Motor shall be suitable for operation on a 415V, 3 phase, 3 wire ungrounded supply system
2.M.1.2	Motor shall operate without any trouble under the following conditions. a. If the voltage varies within plus or minus 10% of the rated value of 415 Volts. b. If the frequency of the power source varies within plus or minus 5% of 50 c/s. c. If the voltage and frequency of the source vary simultaneously and the sum of the absolute percentage values in variation does not exceed 10%.
2.M.2.0	CONSTRUCTION:
2.M.2.1	Motor shall be totally enclosed with min IP68 weatherproof enclosure and shall be suitable for outdoor installation without canopy. In case of any water leakage due to enclosure failure it shall be attended free of cost within one week and root cause of the problem shall be eliminated within one month
2.M.2.2	Motor shall be conforming to BS 2613-70, IS 325 or any other equivalent international standard for all requirements unless otherwise specified herein.
2.M.2.3	Motor shall be painted with corrosion proof & weather proof paint. Painting colour scheme shall be as per BHEL's requirement, which will be informed after placement of order.
2.M.3.0	INSULATION:
2.M.3.1	Motor shall have class F non-hygroscopic insulation with tropicalisation suitable for polluted dusty and corrosion atmospheres of relative humidity 100%. Motor shall be designed for the design ambient temp. However, the temperature rise of the motor winding shall be limited to the maximum temperature allowed for class 'B' insulation. It shall also be possible to rewind the motor in case the windings and insulation get burnt out.
2.M.4.0	RATING:
2.M.4.1	Motors shall be S2-15 min. rating. This shall not be less than the highest of the following: 1) Fifteen minutes. 2) As required for three successive open/close operations. 3) As required for the service. The motor shall be suitable for min 120 starts/hr. for on/off and 150 starts/hr. for inching duty application. 600 and 1200 starts/hour shall be given as optional.
2.M.5.0	STARTING:
2.M.5.1	Motor shall be suitable for direct on-line starting.
2.M.5.2	Starting current shall be limited to 6 times the full load current.
2.M.5.3	Motor shall be capable of 1. Starting at 85% of rated voltage. 2. Running at 80% of rated voltage for a period of 5 minutes, at 1/3 load. 3. The torque at reduced supply voltage shall be mentioned for 75% voltage, 80% voltage, 85% voltage & 90% voltage.
2.M.6.0	BEARINGS:
2.M.6.1	Bearing shall be of double shielded, grease lubricated antifriction type. The anticipated bearing life shall be indicated for all models.
2.M.7.0	EARTHING TERMINALS:
2.M.7.1	Two earthing terminals shall be provided on either side of the motor.
2.M.8.0	MOTORS:
2.M.8.1	Motors shall be provided with three numbers of Thermostats, one in each winding, for over load protection.
2.M.9.0	MOTOR DATA:
2.M.9.1	One set of hard and soft copies of motor data sheets for each type of actuators ordered shall be furnished as per format furnished.
2.M.10.0	WEIGHT
2.M.10.1	Weight of the actuator with and without starter shall be furnished separately along with the offer.

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2.M.11.0.	TESTS:
2.M.10.1	Tests shall be carried out as per approved QP.
2.C.0	CONTROLS
2.C.1.0	INTERNAL WIRING:
2.C.1.1	Internal wiring diagram shall be neatly pasted on cover of terminal box.
2.C.1.2	Internal wiring shall be done with 1.5 sq.mm PVC insulated copper wires. Ferrules should be provided on both ends of the wire for easy identification.
2.C.2	FEATURES APPLICABLE TO INTEGRAL STARTER
2.C.2.1	Control supply shall be derived with step down transformer from 415V, 3 PH incoming supply (For AC actuator only). Necessary primary and secondary fuses shall be provided. All the PCBs shall be protected against moisture by suitable coating and treatment - in case of failure of PCBs due to moisture entry it shall be attended free of cost within one week and root cause of the problem shall be eliminated within one month
2.C.2.2	Automatic phase correction facility and single phasing prevention shall be available.
2.C.2.3	Pad lockable Selector switch for LOCAL-OFF-REMOTE selection with OPEN-STOP-CLOSE push buttons (for local operation) shall be provided.
2.C.2.4	It should also be possible to reverse the direction of travel for inching valves (in LOCAL and REMOTE) without giving stop command.
2.C.2.5	In addition to mechanical dial position indicator, lamp indication for full open, full close and in-travel positions shall be provided.
2.C.2.6	Electrically and mechanically interlocked contactors shall be provided for forward and reverse operation. Contactor rating shall be sufficient to withstand the extreme conditions like valve jamming and instantaneous reversal of motor.
2.C.2.7	Potential free contacts for LOCAL-OFF-REMOTE positions shall be wired to terminals and available for customer connections.
2.C.2.8	Open/Close command termination logic with position and torque limit switches shall be suitably built in the PCB inside the actuator.
2.C.2.9	The selection of the following mode shall be available locally on actuator through suitable switch programming. It shall also be clearly described in wiring diagram. a) Valve seating by torque switch (close) or limit switch (close) shall be available. b) Inching (non self-retaining) or non-inching (self-retaining) for remote command and local mode shall be field configurable.
2.C.2.10	Provision shall be there for bypassing the torque switch during initial 5% opening and closing of valves. Details for this must be indicated in the wiring diagram. This shall be done through electronic circuit or through one 'NC' contact of 'limit switch'.
2.C.2.11	A minimum of '1NO+1NC' contact of Main limit switches and torque switches shall be available for customer use. All the contacts of aux. Limit switches shall also be available for customer use.
2.C.2.12	Actuator shall be suitable for remote operation by potential free contacts for open / close and stop, the necessary 24V DC power supply shall be derived internally. Also It shall be possible to energise the interposing relays provided (with coil burden $\leq 2.5VA$, one for open and one for close) to initiate opening and closing by 24V DC signal from the external control system.
2.C.2.13	24V Power supply for EPT shall be derived internally.
2.C.2.14	Thermal overload relay shall be provided in addition to thermostats embedded in motor winding. Overload relay and thermostats shall be connected in control circuit to trip actuator in case of overload. OLR set value shall be mentioned in wiring diagram / Data sheets.
2.C.2.15	A common potential free contact (monitoring relay) shall be available to annunciate the following faults. a) Thermostat trip

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	b) OLR trip
	c) Valve jammed in mid-travel.
	d) Motor single phasing.
	e) Power failure.
	f) Local stop or local/remote selector switch in local mode.
2.C.2.16	The following status annunciation shall be made available locally (integral to actuator) (Diagnostic tool in place of indication is acceptable provided one diagnostic tool for 15 actuator is supplied free of cost , and local indication is developed within one year of this MOU.)
	a) Actuator running in OPEN
	b) Actuator running in CLOSE
	c) Internal 24V DC Control voltage healthy
	d) 24V DC availability for customers use healthy.
2.C.2.17	The following individual fault annunciation shall be made available locally (integral to Actuator) for easy trouble shooting (Diagnostic tool in place of indication is acceptable provided one diagnostic tool for 15 actuator is supplied free of cost , and local indication is developed within one year of this MOU.)
	a) Torque switch OPEN
	b) Torque switch CLOSE
	c) Thermostat trip
	d) Thermal overload relay trip
	e) Motor single phasing
2.C.2.18	BLINKER RELAY: Blinker relay contact for remote indication of 'actuator running' is to be provided as a standard part of integral starter actuator.
2.C.3.0	TERMINAL BOX:
2.C.3.1	All terminals of position limit switches, torque limit switches, space heaters and position transmitters shall be brought to a common terminal board. The terminals shall be clip-on type/screw type with sufficient insulation between 2 adjacent terminals. All terminals must be suitable for 2 nos. of 2.5 sq.mm wires.
2.C.3.2	Minimum 10 numbers of terminals shall be available in the terminal board as spare terminals.
2.C.3.3	Terminal box of actuator shall be weather proof and have enough space for connecting three numbers of PVC insulated unarmoured copper conductor control cable 19-pair / 1.5 sq.mm. One Number PVC insulated unarmoured copper / aluminium conductor power cable with sizes as indicated in clause C.3.1. Motor terminals shall be of stud type, screw type and press fit type depending on the power rating. Terminal box shall be fitted with a removable front cover plate.
2.C.3.4	DEFAULT SETTING OF TORQUE SWICTH, DIAL INDICATOR ON AND TORQUE/LIMIT CLOSING. The requirement of the default setting of torque switch, dial indicator and torque closing/limit closing selections are already provided by BHEL for all models. The same has to be followed. The list of default setting to be included in the documents.
2.C.4.0	CABLE GLAND:
2.C.4.1	Actuators are to be provided as a standard with one cable gland for power and minimum 1 cable gland and two plug & sockets for control to be provided (In case of flameproof actuator 3 cable glands for control to be provided). The cable gland details along with the cable OD that can be accommodated is indicated below. If any other cable size is envisaged this will be informed during order stage. However for actuators with plug and socket, minimum necessary cable glands shall be provided. All the cable glands shall be of double compression type. Power cable size is given below. The cable entries shall be closed with metallic gland plug with suitable sealing (like 'o' ring) to ensure IP68 protection

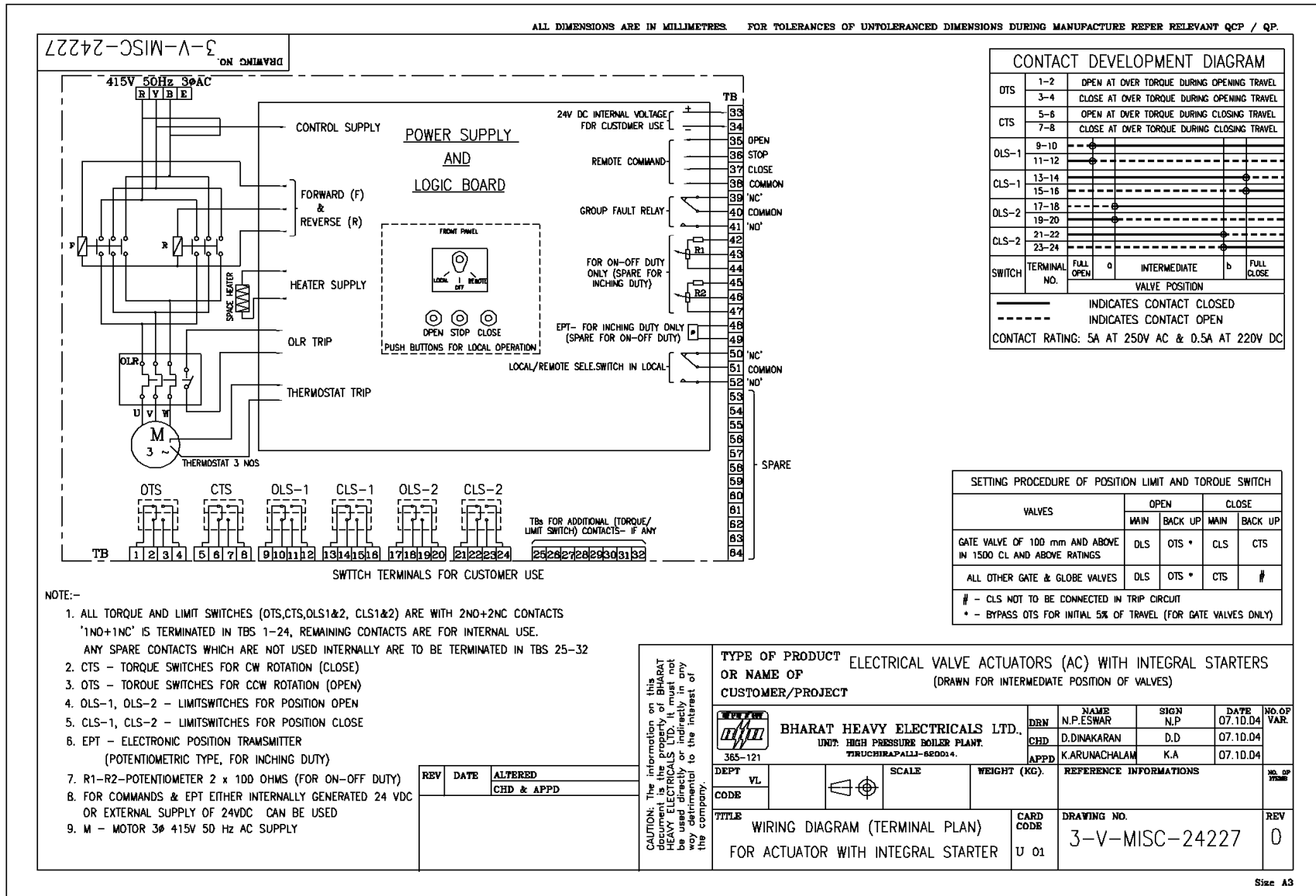
PRODUCT ENGINEERING / VALVES: BHEL / TIRUCHIRAPPALLI-14

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KW	DESC	<u>OD</u>
UPTO 3 KW	3 Core x 2.5Sq.mm Copper unarmored PVC insulated	14±2mm
3 – 7 KW	3 Core x 6Sq.mm Aluminum unarmored PVC insulated	17±2mm
7 – 13 KW	3 Core x 16Sq.mm Aluminum unarmored PVC insulated	20±2mm
13 – 24 KW	3 Core x 35Sq.mm Aluminum unarmored PVC insulated	25±2mm
24 – 37 KW	3 Core x 70Sq.mm Aluminum unarmored PVC insulated	31±2mm

2.C.4.2	Preferably all the cable glands shall be provided on one direction (face) only. Wherever this is not technically feasible, the cable gland on the second side shall be provided with necessary elbows, so that all glands will be facing at one side.
2.C.5	FEATURES APPLICABLE TO FLAME PROOF ACTUATORS
2.C.5.1.	STANDARDS
2.C.5.1.1	Actuators meant for hazardous area shall meet the requirements of latest IS 2148/IEC60079 , IEC – 79 or equivalent International Standards.
2.C.5.1.2	Indigenous equipment shall be certified by CIMFR and approved by PESO and DGFASLI and shall carry the BIS License Marking. All the certification shall be valid at the time of delivery.
2.C.5.1.3	Imported equipment shall be tested and certified by an independent certifying agency of country of equipment origin.
2.C.5.2	ENVIRONMENT:
2.C.5.2.1.	Area Classification: Class 1, Division 1, Zone 1
2.C.5.2.2.	Gas Group: IIA & IIB. - IIC if specified
2.C.5.2.3.	Temperature Class (As per IEC-79): T3 (200 Deg. C) T4 if specified
2.C.5.2.4.	Construction: Flame Proof Ex (d) as per IS 2148/IEC60079
2.C.5.3	CABLE GLANDS: Flame proof, double compression Nickel plated brass cable glands shall be provided for conduit entries. Unused entries shall be plugged with flame proof plugs.
2.C.5.4	Document required: CIMFR Test Certificates. Approvals of PESO and DGFASLI. BIS License
2.S.0	SPARES
2.S.0.1	Supplier shall specify a list of recommended spares for 2/5 years trouble free operation. An exploded view of the actuator shall be furnished with part numbers for identifying the spares.

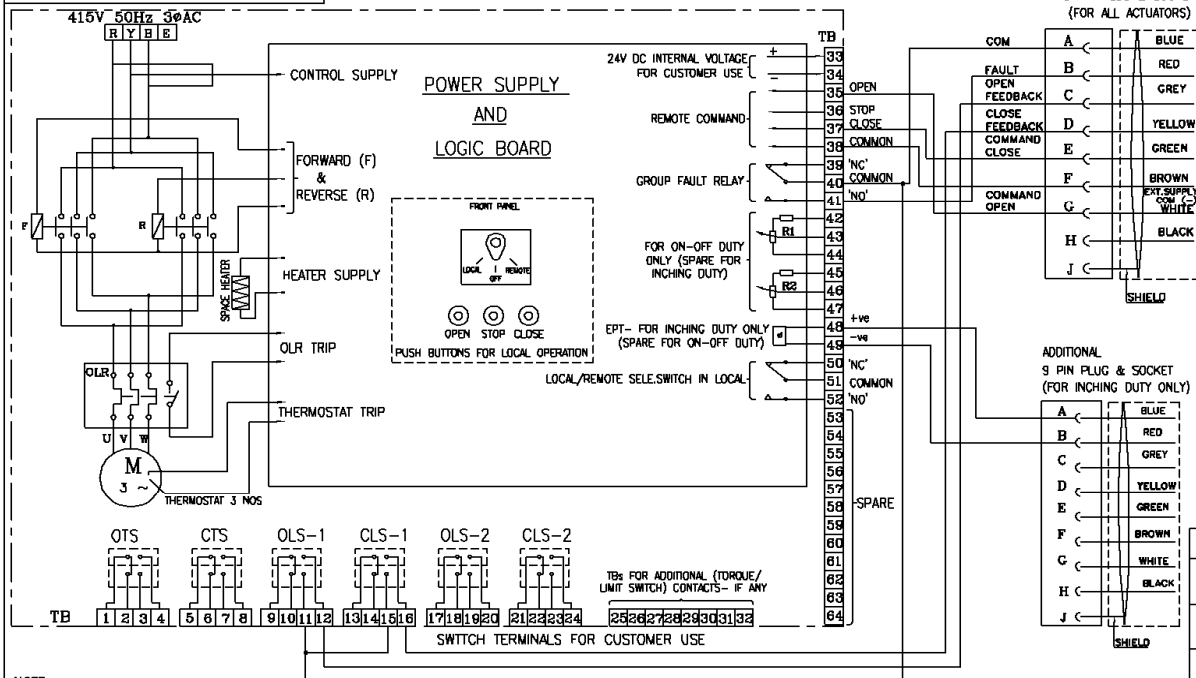
Applicable terminal plans for actuator with integral starter (3-V-MISC-24227) ,
actuator without integral starter ((4-V-MISC-90271) and for NTPC projects integral
starter with Plug&Socket (3-V-MISC-24283) enclosed.



Size A3

3-V-MISC-24283
DRAWING NO.

ALL DIMENSIONS ARE IN MILLIMETRES. FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER RELEVANT QCP / QP.



OTS	1-2	OPEN AT OVER TORQUE DURING OPENING TRAVEL
	3-4	CLOSE AT OVER TORQUE DURING OPENING TRAVEL
CTS	5-6	OPEN AT OVER TORQUE DURING TRAVEL
	7-8	CLOSE AT OVER TORQUE DURING CLOSING TRAVEL
OLS-1	9-10	
	11-12	
CLS-1	13-14	
	15-16	
OLS-2	17-18	
	19-20	
CLS-2	21-22	
	23-24	
SWITCH	TERMINAL NO.	VALVE POSITION
	0	INTERMEDIATE
	a	FULL OPEN
	b	FULL CLOSE

INDICATES CONTACT CLOSED
INDICATES CONTACT OPEN
CONTACT RATING: 5A AT 250V AC & 0.5A AT 220V DC

VALVES	OPEN		CLOSE	
	MAIN	BACK UP	MAIN	BACK UP
GATE VALVE OF 100 mm AND ABOVE IN 1500 CL AND ABOVE RATINGS	OLS	OTS *	CLS	CTS
ALL OTHER GATE & GLOBE VALVES	OLS	OTS *	CTS	#

- CLS NOT TO BE CONNECTED IN TRIP CIRCUIT
* - BYPASS OTS FOR INITIAL 5% OF TRAVEL (FOR GATE VALVES ONLY)

- NOTE:-
- ALL TORQUE AND LIMIT SWITCHES (OTS,CTS,OLS1&2, CLS1&2) ARE WITH 2NO+2NC CONTACTS '1NO+1NC' IS TERMINATED IN TBS 1-24, REMAINING CONTACTS ARE FOR INTERNAL USE. ANY SPARE CONTACTS WHICH ARE NOT USED INTERNALLY ARE TO BE TERMINATED IN TBS 25-32
 - CTS - TORQUE SWITCHES FOR CW ROTATION (CLOSE)
 - OTS - TORQUE SWITCHES FOR CCW ROTATION (OPEN)
 - OLS-1, OLS-2 - LIMITSWITCHES FOR POSITION OPEN
 - CLS-1, CLS-2 - LIMITSWITCHES FOR POSITION CLOSE
 - EPT - ELECTRONIC POSITION TRANSMITTER (CONTACTLESS TYPE, FOR INCHING DUTY)
 - R1-R2-POTENTIOMETER 2 x 100 OHMS (FOR ON-OFF DUTY)
 - FOR COMMANDS & EPT EITHER INTERNALLY GENERATED 24 VDC OR EXTERNAL SUPPLY OF 24VDC CAN BE USED
 - M - MOTOR 3Ø 415V 50 Hz AC SUPPLY
 - TORQUE SWITCH BYPASS WITH LIMITSWITCH BOTH ON OPEN & CLOSE DIRECTION TO BE DONE INTERNALLY.

REV	DATE	ALTERED
		CHD & APPD

CAUTION: The information on this drawing is the property of Bharat Heavy Electricals Ltd. It must not be used directly or indirectly in any way detrimental to the interest of the company.

TYPE OF PRODUCT ELECTRICAL VALVE ACTUATORS (AC) WITH INTEGRAL STARTERS		OR NAME OF FOR NTPC PROJECTS	
CUSTOMER/PROJECT (DRAWN FOR INTERMEDIATE POSITION OF VALVES)		DRN	NAME
365-121		CHD	N.P.ESWAR
Bharat Heavy Electricals Ltd., UNIT: HIGH PRESSURE BOILER PLANT, TIRUCHIRAPPALLI-620014.		DATE	17.03.05
DEPT		APPD	K.ARUNACHALAM
VL	SCALE	WEIGHT (KG)	REFERENCE INFORMATIONS
	NTS		
CODE		CARD CODE	DRAWING NO.
		U 01	3-V-MISC-24283
TITLE FOR ACTUATOR WITH INTEGRAL STARTER WITH PLUG & SOCKET FOR NTPC PROJECTS			REV 0

Size A3

3.0 Documentation Requirements

The following documents are to be attached with MOU
a. GA drawings for all models including dismantling clearances.
b. The dimension drawing of the blank adopter bush
c. Data sheet for all models. Along with weight of the actuator
d. Dimensional catalogue with maximum spindle acceptance details
e. Wiring diagram for all models.
f. Gear selection chart for setting of local position indicator
g. Outline dimension of assembled motor.
h. Outline dimension of actuator.
i. Dimensional drawing of terminal showing the method of terminating incoming cables.
j. General arrangement drawing of actuator consisting following as minimum
k. Identification of critical component with its material composition.
l. Mounting flange dimension
m. Hand wheel dimensions
n. Actuator cover removal clearances
o. Weight of actuator with and without integral starter
p. Stem protection cover length, thread size and type
q. Double compression cable gland
r. Separate drawing for details of cable gland cross section, min/ max.
s. cable OD that can be accommodated, critical dimension etc.
t. Quality plan.
u. Type test certificates
v. Default settings of torque, dial indicator and torque/limit closing for all models.

3.0 Quality requirements

4.1 INSPECTION AND TEST REQUIREMENTS

All equipments shall be subject to inspection by BHEL/ Client and/or their nominated inspecting authority. Vendor shall make all provisions in his shop/sub-vendors shops for complete inspection and test of soot blowers.

4.2 Tests & Inspection:

- 4.2.1 During fabrication/testing, the actuator shall be subject to inspection by BHEL/CUSTOMER or by any agency authorized by them. Manufacturer shall furnish all necessary information concerning the supply to BHEL/CUSTOMER inspectors.
- 4.2.2 All routine tests as specified by the applicable standards shall be conducted.
- 4.2.3 Shop tests shall be witnessed by an inspector of BHEL/CUSTOMER or of an agency authorized by customer.
- 4.2.4 Quality plan for the actuator to be followed.

4.3 Painting, Protection, Packing, Supply and Identification:

4.3.1 **Surface Preparation:** Weld slag & spatter shall be removed and the surfaces to be coated shall be free from contamination. Surface defects shall be removed by suitable methods. Sharp edges shall be smoothed by grinding. Prior to surface preparation oil, grease, drilling emulsions, cutting emulsions and preservative agents shall be carefully removed by suitable solvents. The surface shall be carefully dried with clean cloths to prevent the dissolved impurities from spreading over the entire surface. The surface shall be cleaned by wire brush and shot blasting if required. Proper adhesiveness of paint to the surface shall be ensured.

4.3.2 **Paint Shade**

The enclosures shall be treated and prepared for painting with suitable painting system for withstanding 500Hrs of salt spray as per ASTM B-117/ ISO9227 standard.

Paint shade shall 'shade 692 of IS 5 (Smoke Grey)'

For NTPC projects the paint shade shall be as per the NTPC approved shade

4.4 Packing & Transport:

The actuator shall be supplied to site packed in wooden crates / Carton boxes. They shall be wrapped with polythene sheets. They shall have skid bottoms for handling. All spares shall be packed separately in boxes marked SPARE Special precaution notations such as Fragile. This side up, centre of gravity, weight, Owner's particulars. Purchase number etc. shall be clearly marked on the package together with other details as per purchase order.

The equipment may be stored in a covered shed for long periods before installation. The packing should be suitable for such storage.

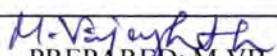
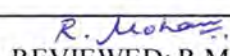

4.T.0	TEST REQUIREMENTS FOR ACTUATORS
4.T.1.0	ROUTINE TEST:
4.T.1.1	Dimensions: Overall and mounting
4.T.1.2	Details of painting as per specification and vendor practice: Anti-corrosiveness Epoxy.
	i. Shade.
	ii. Finish
	iii. Paint thickness
4.T.1.3.	Manual operation through hand wheel.
4.T.1.4.	Testing of position and torque limit switches for accuracy and repeatability.
4.T.1.5.	Hand-Auto switching function.
4.T.1.6	For motors, all routine tests as called in IS: 325 / BS 4999 from motor manufacturer.
4.T.1.7	Output shaft speed and torque of actuator and corresponding current.
4.T.1.8	Stall current and stall torque for the actuator assembly.
4.T.1.9	a. Position indicator and transmitter: Calibration check for accuracy, linearity and repeatability.
	b. Functional test for electronic position transmitter.
4.T.1.10	T.1.10 Leakage test for gear case (visual).
4.T.1.11	HV test at 1.6 KV (80% of 2 KV) for the assembled actuator.
4.T.1.12	Operation of actuator under variation in supply voltage (plus or minus 10%) for verifying rated torque and speed.
4.T.1.13	Checking of wiring as per approved wiring diagram (Typical WD for actuators with out starters is attached)
4.T.1.14	The following tests are applicable for integral starter actuators
	a. Functional test for local / remote / off selection
	b. Open/close/stop operation in local and remote mode.
	c. OLR tripping
	d. Functional test, temperature raise test and burn-in test on PCB
4.T.2.0	TYPE TEST certificates shall be provided for the following tests.
4.T.2.1.	Type test for motor as per IS:325/BS 4999 part 60.
4.T.2.2.	Noise and vibration test for total assembly IS: 4729/BS 4999.
4.T.2.3.	Temperature rise test during:
	a. Operation of actuator at 90% voltage.
	b. Operation of actuator at 50 degree C ambient.

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4.T.2.4.	Operation with variation in frequency (plus or minus 5%) for verifying rated torque and speed.
4.T.2.5.	Enclosure protection for the total assembly.
4.T.2.6.	Endurance test for actuator.
4.T.2.7.	Endurance test for limit switches.
4.T.2.8.	Damp heat cycle test as per IS:9000/IEC 68-30.
4.T.2.9.	Following test are applicable for integral starter actuators
	a. Type test on bare PCB
	b. Life cycle test

4.N.0.	NOTES:
4.N.0.1.	These quality plans shall be approved by BHEL.
4.N.0.2.	All testing facilities shall be arranged by the vendor, at his works before calling BHEL representative for inspection.
4.N.0.3.	Approved drgs., PO specification and relevant standards if any shall be made available during testing / inspection.
4.N.0.4.	All measuring and testing instruments shall be periodically calibrated from National test house and certificates made available during inspection.
4.N.0.5.	All relevant GA drawings, data sheets & wiring diagrams shall be submitted as controlled copy and approval shall be obtained from BHEL. All supply shall be as per these documents.

 PREPARED: M.VB	 REVIEWED: R.M	 APPROVED: D.D	DATE: 11.01.2013
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Instruction for packing of Electrical Valve actuators

Packing box

- 1.1) The actuator shall be supplied packed in wooden crates / hard card board box.
- 1.2) The box shall have inner lining of polythene sheet (minimum of 250G polythene sheet)/waxed paper/water proof paper or similar protection against water entry.
- 1.3) Use fillers like thermocol / loose fill or air-cellular cushioning material such as Bubble Wrap to fill void spaces and prevent movement inside the box during shipping

Actuator Covering

- 1.4) Further the actuator shall be completely covered with a water-proof barrier highly resistance to the passage of water-vapor - like thick polythene bag (Minimum of 500G thickness). Sharp corners, edges and projects of the actuators should be covered to prevent abrasion or puncture of the water proof barrier with anti-abrasive material like felt. Extra length and projections of the polythene bags are to be wrapped and secured by strips of self-adhesive tapes.
- 1.5) After opening the box, the water-proof barrier shall be intact and it is intended to store actuator for long time with this water-proof barrier.
- 1.6) Suitable desiccants shall be provided in to the sealed water proof barrier. The desiccant shall be in small bags and disposed uniformly. They shall be secured in position to minimize chances of desiccant dust escaping. The amount of total desiccant shall be such to limit the relative humidity within the cover to a maximum value of 50 percent – for a long time of storage.

Marking on the box

- 1.7) All spares shall be packed separately in boxes marked SPARE. Spare components are also to be covered separately with water-proof packing.
- 1.8) Actuator model and material code shall be prominently marked on the box.
- 1.9) Special precaution notations such as 'Fragile', 'This side up', 'center of gravity', 'weight', 'Owner's particulars', 'Purchase Order No.', 'Order item No.' etc. shall be clearly marked on the package together with other details as per purchase order.

PREPARED: DD		APPROVED: KN	DATE: 12.07.2013
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BHARAT HEAVY ELECTRICALS LTD

Valves/Purchase, Tiruchirappalli-620014, INDIA

SPECIAL TERMS AND CONDITIONS AND SCOPE OF SUPPLY

Phone: 0431 257 7434

Email: npeswar@bheltry.co.in

Refer enquiry EN-SAC-215 for procurement of low torque electrical actuators for BHEL. Kindly send your competitive offer immediately for our consideration. The tender will be opened positively **on 31.03.2014 at 14.30 IST.**
The following special terms and conditions and scope of supply will be applicable to this enquiry:

Kindly go through the enclosed technical specifications:

- No: PRODUCT ENGINEERING / VALVES: BHEL / VAL/ACT/AC/001 REV.06 DT: 11.01.2013
- Actuator packing Details -VAL_ACT_PACKING_001_REV_00_DT12.07.2013

Submit your competitive offer in duplicate indicating compliance or deviation for each point of the specification with a validity of 2 years for ordering. The tender should be submitted in two parts i.e. Technical cum commercial bid in separate sealed cover and Price bid in another cover separately. After technical conformance the price bid will be opened.

1. Your offer shall be supported by relevant technical documents like Quality plans, catalogues, leaflet, General arrangement drawings etc... for technical evaluation and for getting customer approvals.
2. Offer for Operational spares required may be given as mentioned in the annexures.
Also, offers for additional spares required if any, required for the trouble free , shall also be mentioned.
3. Quote your rates on FIRM PRICE basis. Once finalized, the rate contract will valid be for a minimum 24 months. Hence, the quoted prices should be valid for a period of 24 months.
4. The prices shall be quoted per unit basis for each item. The vendors should quote prices as below:
Indigenous vendors: FOR-BHEL-Trichy and FOR-BHEL-Goindwal separately for each item.
Foreign Vendors: FOB Nearest AIR/SEA Port for each item.
5. Only Manufacturers are eligible to participate in this bid. Traders & Dealers are not eligible to participate in this bid. If authorized dealer of a manufacturer is participating in the bid, their offer will be considered only if they furnish the mutually signed Agency Agreement.
6. Kindly quote for enclosed specification or equivalent that meets Technical Delivery Conditions (copy attached).
7. The quantity indicated are approximate only as per last year (2012-13) requirement.
8. The purchase orders will be released based on our production plan periodically based on the delivery requirement in the same. Offers not meeting this delivery will not be considered.
9. Prices shall be firm till entire execution of the Purchase Order. ie Price variation clause is not acceptable.
10. Lowest prices received against BHEL enquiries need not be the technically acceptable one and in that case, BHEL reserves the right not to consider the same.
11. Supplier's has to submit test reports for each serial no's as per our TDC conditions and packing also to be done for each item separately.
12. Terms of Payment:

For Indigenous Suppliers: BHEL payment terms is 100% after 45 days on satisfactory receipts and acceptance of material at BHEL stores. LC/Advance Payment will not be operated for indigenous vendors. Offers of indigenous vendors with payment terms as LC/Advance Payment from Indigenous vendors are liable for rejection.



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13. **For Import Suppliers:** BHEL Payment terms is 100% payment on CAD basis after 45 days from the date of receipt of documents, specified in PO at BHEL Bank. Respective bank charges to respective account. In the case of Usance LCs the loading will be considered @ 1.5% on the offered value. For LC at sight, the loading will be considered @ 3.5% on the offered value. Normally, CAD at sight and confirmed LCs are liable for rejection.
14. One copy of Test certificates/non-negotiable documents shall accompany the dispatches. Supplier should upload the soft copy of all Test Certificates in BHEL website <http://vis.bheltry.co.in/vis/index.jsp> at Vendor information system tab.
15. **Delivery schedule** shall be strictly as per BHEL requirements only, which is indicated in the Enquiry / Purchase Order sheet that will be issued. In case of delay in delivery, beyond the end delivery dates given in the Purchase Order sheet, Liquidated Damage clause will be applicable at the rate of 0.5 % of the total order value per week or part there of subject to a maximum of 10% of the total order value. For staggered delivery schedule, LD shall be 0.5% of the undelivered portion per week of the delay or part there of subject to a maximum of 10% of the total order value.
16. The delivery of the item shall be strictly as per BHEL's enquiry/ Purchase orders. In case of urgency, the delivery period have to be altered to meet BHEL's production plan.
17. Confirmation for compliance is to be given in the offer for all the conditions mentioned in the Technical and commercial conditions
18. L1 will be given maximum share of the order. If needed, order will be split to other vendors who accept the counter offer value. The L1 negotiated price will be counter offered to other vendors for acceptance and the loading will be decided as mentioned in the example below.
 - (i) If one vendor alone accepting the counter offer rates, loading shall be 60:40 on L1:L2.
 - (ii) If L2 & L3 vendors are accepting the counter offer rates, loading shall be 50:30:20 on L1:L2:L3.
 - (iii) If L2, L3 & L4 vendors are accepting the counter offer rates, loading shall be 40:30:20 :10 on L1:L2:L3:L4.Highest rate bidder will not be considered for this tender if the number of techno-commercially suitable vendors is equal to or more than three.
19. Every dispatch of material shall accompany the packing list, detailing the Numbers of items. An advance Copy of dispatch details shall be furnished to purchase/Valves/BHEL/Tiruchy-14.
20. The materials are to be dispatched with proper packing and binding as mentioned in the packing specifications.
21. BHEL reserves the right to finalize the tender either through **price bid open** or **through Reverse Auction route**.
22. **The offers are invited in two parts: a) Techno commercial bid covering Technical Conditions, Delivery conditions, acceptance of all our commercial conditions and a copy of unpriced price bid. (Please submit a separate envelope super scribing the enquiry no for techno commercial bid). Those vendors who are covered in the existing MOU have to submit only the compliance letter to the technical MOU specifications and acceptance to the enquiry commercial conditions. b) Price bid covering only unit price each case. (Please submit a separate envelope super scribing the enquiry no for price bid. The Techno Commercial bid will be opened first. The price bids of technically suitable vendors only will be opened with prior intimation.**
23. To those vendors who are not in BHEL Product Material Directory (PMD), the following additional conditions are applicable :
 - a. The vendors who are not there in existing Rate contract and who wish to participate in the new rate contract must strictly adhere to BHEL technical requirement included in NIT condition so as to maintain the technical flexibility existing now.
 - b. The vendors should submit the offers along with duly filled in vendor registration forms which can be down loaded from our website www.bhel.com. Vendors should also apply through the web and furnish the



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reference no in the hard copy also. Offer without the above forms & the relevant supporting documents will not be considered for technical evaluation. Incomplete information for registration will be out rightly rejected without any further notice for this tender as it will lead to time loss in the rate contract finalisation.

c.For indigenous sources, BHEL team shall visit the vendor works and assess to enlist them in our vendor directory and then their offer will be technically evaluated.

d.The import sources will be enlisted in our vendor directory based on evaluation by Supplier Registration Form (SRF) and D & B (M/s DUN & Bradstreet) statement and then their offer will be technically evaluated.

e.The vendor should submit credentials of supplying their products and their functioning for a minimum of three years to two power plants of 250 MW and above.

f. The vendor should also submit credentials of supplying their products to other similar valve manufacturers.

g.The vendor should support the technical suitability with Endurance Certificates as per IS:9334.

24. If the supply is short the extra cost to BHEL in replenishing the short fall will be debited to the vendor.
25. Along with the offer (Technical/Commercial bid and price bid in two separate sealed covers) you are requested to indicate from whom you are going to source the components also send a typical type Test Certificate for the components from that maker. Without the type Test Certificate, your offer may not be considered for further processing's.
26. The tenders may be dropped in the tender box is placed in the location in "Purchase/ Valves, Third floor, Building-24, BHEL-Trichy-14"
27. Non-adherence to these special conditions of enquiry and BHEL's general terms and conditions may lead to disqualification of offer.
28. In addition to all the above conditions, BHEL general terms & conditions given as a separate annexure shall also be applicable to the extent they are not superseded by the above conditions.



BHARAT HEAVY ELECTRICALS LTD

Valves/Purchase, Tiruchirappalli-620014, INDIA

GENERAL TERMS AND CONDITIONS

Phone: 0431 257 7434

Email: npeswar@bheltry.co.in

1. QUOTATIONS:

- a. **Submission of Tender:** Each offer should be sent in double cover separately and the same should be sealed and super scribed with correct Tender No., item of supply and due date of opening. Two or more quotations should not be sent in one cover. Price Bid should contain only Price in Rs per unit for each type. Tender should not be addressed to any individual's name but only by designation as below:
- [Sr. Manager/Purchase/Valves](#)
[High Pressure Boiler Plant](#)
[Bharat Heavy Electricals Limited](#)
[Tiruchirappalli - 620 014, Tamilnadu, India](#)
- b. **Late tenders:** Late tenders shall not be considered under any circumstance.
- c. **Regulations:** Tender should be accompanied by detailed technical literature, Catalogue and detailed dimensional drawings in ENGLISH. Tenders should be free from CORRECTION AND ERASURES. Corrections if any must be attested. All amounts shall be indicated both in words as well as figures. Where there is difference between amount quoted in words and figures, amount quoted in words shall prevail.
- d. **Two Bid Systems:** If tender calls for two-part bid system (Techno commercial & price Bid). First the Techno Commercial bid will be opened. Techno-commercially suitable vendors alone will be intimated for price bid opening or Reverse Auction.
- e. **PVC:** Price Variation clause not acceptable. Prices should be firm.
- f. **Catalogue:** Manufacturer's name, Trade Mark or Patent No. if any should be specified. Illustrative leaflets giving technical particulars are required along with quotation wherever necessary.
- g. **Acceptance:** The purchaser shall be under no obligation to accept the lowest or any other tender and shall be entitled to accept or reject any tender in part or full without assigning any reason whatsoever.

2. COMMERCIAL TERMS & CONDITIONS:

a. **Terms of Payment:**

For Indigenous Suppliers : BHEL payment terms is 100% after 45 days on satisfactory receipts and acceptance of material at BHEL stores.

Any deviation in the above payment terms will attract loading as mentioned below:

"Base rate of SBI (as applicable on the date of bid opening. Techno-commercial bid opening in case of two part bids) + 6% shall be considered for loading for the period of relaxation sought by bidders.

Payment through Bank is not preferred. In case payment through bank is opted by supplier, BHEL prefers document submission through bank with copy of LR and door delivery of goods to site/stores with consignee copy attached. In this case, loading will be 3% on the offered value. In case of direct to site(DTS), only 90 % through bank will be considered.

LC/Advance Payment will not be operated for indigenous vendors. Offers of indigenous vendors with payment terms as LC/Advance Payment from Indigenous vendors are liable for rejection.

For Import Suppliers: BHEL Payment terms is 100% payment on CAD basis after 45 days from the date of receipt of documents, specified in PO at BHEL Bank. Respective bank charges to respective account.

Any deviation in the above payment term will attract loading as mentioned below.

"Base rate of SBI (as applicable on the date of bid opening. Techno-commercial bid opening in case of two part bids) + 6% shall be considered for loading for the period of relaxation sought by bidders.

In the case of Usance LCs the loading will be considered @ 1.5% on the offered value.

For LC at sight, the loading will be considered @ 3.5% on the offered value.

Normally, CAD at sight and confirmed LCs are liable for rejection.

- b. **Liquidated Damage:** Liquidated damages shall be 0.5% of the total order value per week or part thereof subject to a maximum of 10% of the total order value.
- For staggered delivery schedule, LD shall be 0.5% of the undelivered portion per week of the delay or part thereof subject to a maximum of 10% of the total order value.
- Any deviation from the above LD clause, loading will be applied to the extent to which it is not agreed by the bidder (at offer value).
- c. **Delivery Terms:**
- For Indigenous Suppliers:** FOR BHEL Trichy and FOR BHEL GOINDWAL separately as mentioned in enquiry inclusive of freight and insurance.
- For Import Suppliers:** FOB nearest SEA Port/AirPort.
- d. **Validity of Offer:** Prices should be valid for 120 days from the date of opening of this tender considering the processing time of tender. But, the prices should be valid for 24 months in the Rate Contract.



BHARAT HEAVY ELECTRICALS LTD

Valves/Purchase, Tiruchirappalli-620014, INDIA

GENERAL TERMS AND CONDITIONS

Phone: 0431 257 7434

Email: npeswar@bheltry.co.in

- e. **Duties and Taxes:** If any Sales Tax is payable as extra to the quoted price, it should be specifically stated in quotation along with CST & T.N.G.S.T No. failing which the purchaser will not be liable for payment of Sales Tax. Our T.N.G.S.T No. 3550005 Dated 01-04-1995 C.S.T. No. 259383 Dt. 11.06.1991.
- f. **Risk Purchase:** Alternatively the purchaser at his option will be entitled to terminate the contract and to purchase elsewhere at the risk and cost of seller either the whole of goods or any part which the supplier has failed to deliver or dispatch within the time stipulated as aforesaid or if the same were not available, the best and the nearest available substitute therefore. Supplier shall be liable for any loss which the purchaser may sustain by reason for such risk purchases in addition to penalty at the rate mentioned in clause 2 b above.
- g. **Preferential Delivery:** If a contract is placed on a higher tender as a result of this invitation to tender in preference to the lowest acceptable offer in consideration of the earliest delivery, the seller will be liable to pay to the purchaser the difference between the contract rate and that of the lowest acceptable tender on the basis of final price FOR destination, including all elements of freight, sales tax, duties and other incidents, incidental in case of failure to complete supplies in terms of such contract within the date of delivery specified in the tender and incorporated in the contract.
- h. **MODVAT/CREDIT:** If any Excise Duty is payable, the chapter head/sub-head reference and the rate of the duty should be quoted. If the tender is availing MODVAT credit for his input materials, the effect of proforma invoice should be passed on to the purchaser.
- i. **Miscellaneous:** Any Other conditions which might have been quoted by the seller and are in contravention to the terms prescribed in the order and which have not been specifically accepted in by Purchaser will not be applicable to the contract.

3. GENERAL CONDITIONS

- a. BHEL reserves the right to finalize the tender as per item sl no wise or as a total package or project wise. Separate orders will be released for each project and documents should be supplied for each order separately.
- b. BHEL reserves the right to increase or reduce or split the Tender Quantity and to NOT to order for some or all material based on the changes in project.
- c. BHEL shall have the right to visit vendor works during the execution of contract along with end customer for verifying status, inspection and testing of the material.
- d. BHEL reserves the right to negotiate or re-float the tender in case the quoted prices are not acceptable.
- e. Supplier shall arrange packing to avoid lose or damages during Road Transport, Site handling & Storage.
- f. Purchase Order, PO Item SI No, Material code, Quantity should marked the Packing clearly.
- g. Confirmation for compliance is to be given in the offer for all the conditions specified above and to the respective Purchase Specification.
- h. The Clause: Special provisions for Micro and small enterprises (MSE) will be followed - according to gazette notification issued by Ministry of Micro, Small and Medium enterprises and corp MM circular no. 17 dtd 24.08.2013

4. DOCUMENTATION:

For Indigenous suppliers:-

- a. **With Consignment:** Duplicate for transporter copy of Invoice, Packing List, Delivery Challan, O&M manual Material Test Certificate, Test Certificates, Calibration Report, Compliance Certificate & Guarantee/Warranty Certificate etc...
- b. **Online Submission:** Supplier should upload the soft copy of all Test Certificates in BHEL website <http://vis.bheltry.co.in/vis/index.jsp> at Vendor information system tab.
- c. **To Finance:** Original and Duplicate Invoice for payment with GR reference ,should be sent directly to

[Sr Manager/Finance/Valves-Bills section](#)
[HPBP BHEL Tiruchirappalli-620014, Tamilnadu.](#)

To Purchase:

- FOR BHEL TRICHY case-**Copy of Invoice, Packing list, LWBand Delivery challan for reference, original IBR documents/Inspection despatch clearance certificates
- d. **Identification:**, Purchase Order, PO item SI No, Material code, quantity, Unique SI No if any should be provided in all despatch documents, materials and packing clearly.

For Import suppliers:-

- a. **With Consignment:** O&M manual and Packing List, Fumigation certificates (In case of SEA shipment).
- b. **Through Bank:** All Original Documents in Triplicate Bill of lading in case of SEA/Airway Bill in case of AIR consignment, the invoice indicating the Unit price & total price, Packing List contains quantity ,net & gross weight,



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Packing dimensions, Certificate of Origin, all Inspection test certificates, Guarantee/warranty certificates are to be sent through supplier's bankers to BHEL bankers

- c. **To Purchase:** One copy of above non-negotiable documents are to be sent to purchase department after dispatch of the materials to follow up with freight forwarder.
- d. **Identification:**, Purchase Order, PO item SI No, Material code, quantity, Unique SI No if any should be provided in all materials and packing clearly.

INTEGRITY PACT

Between

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi – 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for

_____. The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint Independent External Monitor(s), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1 – Commitments of the Principal

- 1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-
 - 1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
 - 1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.
 - 1.1.3 The Principal will exclude from the process all known prejudiced persons.
- 1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 – Commitments of the Bidder(s)/ Contractor(s)

- 2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.
 - 2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved

in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he / she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

- 2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
- 2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant IPC/ PC Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
- 2.1.4 The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.
- 2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

Section 3 – Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors". framed by the Principal.

Section 4 – Compensation for Damages

- 4.1 If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent Earnest Money Deposit/Bid Security.
- 4.2 If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit/Performance Bank Guarantee, whichever is higher.

Section 5 – Previous Transgression

- 5.1 The Bidder declares that no previous transgressions occurred in the last 3 years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.
- 5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section 6 – Equal treatment of all Bidders/ Contractors/ Sub-contractors

- 6.1 The Bidder(s)/ Contractor(s) undertake(s) to obtain from all subcontractors a commitment consistent with this Integrity Pact and report Compliance to the Principal. This commitment shall be taken only from those sub-contractors whose contract value is more than 20 % of Bidder's/ Contractor's contract value with the Principal. The Bidder(s)/ Contractor(s) shall continue to remain responsible for any default by his Sub-contractor(s).
- 6.2 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors.
- 6.3 The Principal will disqualify from the tender process all bidders who do not sign this pact or violate its provisions.

Section 7 – Criminal Charges against violating Bidders/ Contractors /Sub-contractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 –Independent External Monitor(s)

- 8.1 The Principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

- 8.2 The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.
- 8.3 The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all contract documentation of the Principal including that provided by the Bidder(s)/ Contractor(s). The Bidder(s)/ Contractor(s) will grant the monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his contract documentation. The same is applicable to Sub-contractor(s). The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s) / Sub-contractor(s) with confidentiality.
- 8.4 The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.
- 8.5 As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or heal the situation, or to take other relevant action. The Monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.
- 8.6 The Monitor will submit a written report to the CMD, BHEL within 8 to 10 weeks from the date of reference or intimation to him by the Principal and, should the occasion arise, submit proposals for correcting problematic situations.
- 8.7 The CMD, BHEL shall decide the compensation to be paid to the Monitor and its terms and conditions.
- 8.8 If the Monitor has reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant IPC / PC Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the

Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8.9 The number of Independent External Monitor(s) shall be decided by the CMD, BHEL.

8.10 The word 'Monitor' would include both singular and plural.

Section 9 – Pact Duration

9.1 This Pact begins and shall be binding on and from the submission of bid(s) by bidder(s). It expires for the Contractor 12 months after the last payment under the respective contract and for all other Bidders 6 months after the contract has been awarded.

9.2 If any claim is made / lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified as above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 – Other Provisions

10.1 This agreement is subject to Indian Laws and jurisdiction shall be registered office of the Principal, i.e. New Delhi.

10.2 Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

10.3 If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.

10.4 Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

10.5 Only those bidders/ contractors who have entered into this agreement with the Principal would be competent to participate in the bidding. In other words, entering into this agreement would be a preliminary qualification.

For & On behalf of the Principal

For & On behalf of the Bidder/ Contractor

(Office Seal)

(Office Seal)

Place-----

Date-----

Witness: _____

Witness: _____

(Name & Address) _____

(Name & Address) _____
